

## The Nakhodka Incident: Response and Lessons

Chikara Sudo  
G.S.D.F. 302 Engineering Commander and  
Commander of Camp Sabae  
as well Lieutenant Colonel

1. Opening remarks
2. On-site activities of the Self-Defense Forces
- (1) Dispatch of Self-Defense Forces for disaster-relief activities

Self-Defense Forces were ordered to five prefectures to respond to a disaster caused by a spill of heavy oil. The Maritime Self-Defense Forces engaged in ship-based heavy oil recovery on the ocean, recovering about 600 kiloliters. The Air Self-Defense Forces were ordered to Ishikawa Prefecture where they recovered heavy oil by hand and also used aircraft to transport the recovered oil. The Ground Self-Defense Forces were ordered to the prefectures of Niigata, Ishikawa, and Fukui, where they recovered heavy oil by hand and by machine, and transported the recovered oil.

The Ground and Air Self-Defense Forces recovered a combined total of 1,100 kiloliters and 24 1,000 sandbags-full of oil. A total of 144,000 Self-Defense Force personnel were involved in these activities, along with 11,900 vehicles, 600 aircraft, and 920 ships.

- (2) On-site activities of the Self-Defense Forces

{ Video ( 12 minutes): "Activities of the Self-Defense Forces in Fukui and Ishikawa Prefectures. }

- (3) Assessment of operations by the on-site commanding officer

The heavy oil that was spilled in this incident was unable to be recovered at sea and washed ashore over a large area. The oil hardened from day to day and ultimately solidified, which hampered the recovery process.

On the first day of disaster-relief by the Self-Defense Forces, we began with a "bucket relay" to recover the oil, but this was dauntingly slow going and inefficient. From the second day onwards we were able to use machinery to full advantage, including skimmers provided by the Petroleum Association of Japan, compressors brought in on an experimental basis by a private company, "vacuum cars" to directly suck up the oil, and storage pumps to remove the heavy oil. This greatly improved efficiency.

The coastline involved was very cliffy. While industrial lifts and conveyor belts were used to carry some of the oil recovered in sandbags, and helicopters provided some of the transportation, there were many places where transport had to be accomplished by hand.

As the on-site commanding officer, my days were spent searching for work methods that would be both safe and efficient. My troops performed aggressively and positively in spite of the fact that they were doing thankless work, covered in oil during cold, inclement weather. Their morale was bolstered by a strong awareness that this was a local disaster affecting the community in which they

resided and by a strong desire to take the lead in responding to it as the only troops garrisoned in Fukui Prefecture.

3. Self-Defense Force expertise in disaster response

The Ground Self-Defense Forces have been involved in relief activities for many different kinds of disasters, including earthquake, heavy wind, flood, snow, and forest fires. We therefore have response plans drawn up, and our experience has allowed our organizations to build up considerable expertise. We were not, however, prepared to deal with disasters like this heavy oil spill.

I would draw your attention, however, to the fact that the Self-Defense Forces have played highly visible roles in peace-keeping operations, in the response to the Great Hanshin-Awaji Earthquake, and in the response to the Sarin attack on the Tokyo subway. This quite often leads people to ask if the Self-Defense Forces receive special training for these activities. I personally do not believe special training for these kinds of situations to be necessary.

The Ground Self-Defense Forces trains its personnel in three distinct categories: commissioned officers, sergeants, and enlisted men. Commissioned officers are trained to command battalions and companies; sergeants, platoons. Their training gives them the skills to direct their forces in whatever situation they may encounter. Therefore, if we give our people at the sergeant level and above the people, equipment, and time they need to accomplish their orders, they are able to analyze what they need to do, decide on a procedure for doing it, and lead their troops in its accomplishment.

Our troops are aware of their duty to fulfill the mission of the Self-Defense Forces. They have the sense of responsibility, the discipline, and the solidarity needed to function as a unit. These are all mental qualities that are instilled in them on a day-to-day basis.

It is these factors that I think were instrumental in our disaster-relief activities.

4. Assessment of the oil spill response equipment provided by the Petroleum Association of Japan and/or others

(1) Skimmers

The skimmers are designed to float on the water and be operated by remote control as they automatically recover oil. However, they were not as useful as they could have been under different circumstances because the heavy oil involved was highly viscous and it washed ashore in shallow, rocky areas.

Even still, the skimmers were the single most extensively used pieces of machinery in cleaning up this spill. We set the skimmers in areas in which heavy oil was concentrated and used buckets to scoop up the oil and deposit it in Fastanks and drum cans. In Oshima, which is an area of steep cliffs, the skimmers were transported in by helicopter.

I would, however, like to suggest a couple of modifications in the hoses that I think would make the skimmers easier to use. First, the hoses are long and hard, which makes them heavy and therefore hard to carry. There were cases in which kinks in the hose prevented the oil from getting through. I think it would be better if the hoses were shorter and if they were made of an easily bended material like that used in the vacuum car hoses.

Second, we floated the skimmers on the surface of the water, but were unable to operate them by remote control. The cause appears to be in the hardness and weight of the hoses. The hoses themselves, it would appear, need to be given some buoyancy.

(2) Vacuum cars

Vacuum cars were used to suck up the heavy oil deposited in drum cans by our "bucket relays" and transport it to temporary storage sites. We actually had excess capacity and several of the vacuum cars were sitting idle, so we asked if we couldn't use them to directly vacuum up stranded heavy oil. The answer was that we could not because they would lose their suction if the hoses were extended. We went ahead and tried anyway. What we did was to experimentally attach a polyvinyl chloride (PVC) pipe in the mid-section of the hose, and we found that by doing so we could extend the hoses with little decrease in suction. This enabled us to use all of our vacuum cars to full capacity.

By the third week, however, the heavy oil had become so viscous that the vacuum cars were no longer able to recover it.

(3) Storage pumps

The press reported that the Self-Defense Forces even cleaned off the rocks along the coast. This was not quite accurate. We were having trouble recovering the heavy oil that had seeped into the spaces between rocks, so what we did was to use storage pumps to push the oil back out to sea where we could then clean it up. This did not, however, clean the rocks themselves.

(4) Oil absorbents

Oil absorbents were quite suited to the recovery of comparatively low-viscosity oil floating on the surface. We also tried using them in the final stages of oil recovery and found them to be effective there as well.

(5) Oil absorbing mats

As you saw from the video, our people literally were covered in oil during the clean-up, and one of the biggest tasks we faced was getting the oil off their rain gear and boots. We first used kerosene to remove most of the heavy oil and then sprayed them with hot water. When doing this, we laid oil-absorbing mats under the gear to prevent the oil from scattering.

5. Lessons for future clean-up operations

(1) Manuals and equipment stockpiles

We think it is very important that we create manuals from our experiences with this clean-up. We also think that equipment should be kept in readiness.

I have two specific proposals that I would like to add to this.

First, I would note that the heavy oil recovery efforts of local citizens and volunteers ultimately involves direct recovery with buckets and scoops. If we are

going to have recovery equipment and materials on-hand, we also need a system whereby they can be provided to local citizens and volunteers through their civic governments.

Second, the Ground Self-Defense Forces had primary responsibility for places that local citizens and volunteers could not easily get to rocky areas and coastline without road access. We used helicopters and rough-terrain vehicles to transport the oil recovered from these areas, but there were limits to what these vehicles could do and many cases in which oil had to be transported over long distances by hand. I would therefore like to suggest that research be done on a means of transporting recovered oil directly from the ocean. For example, barges that pull in close to the shallows to load the oil, or buoyant containers for the recovered oil that could be pulled by fishing ships, for instance, to somewhere easier to off-load.

(2) Local support

In the town of Mikuni, which was where the bow of the tanker drifted ashore and the focal point in oil recovery operations, the mayor took the lead in clean-up efforts, visiting the work sites every day to give direction and encouragement. Town employees also pulled together to work on disaster-relief. We were particularly impressed by their willingness to accept Self-Defense Forces and volunteers, to divide up work areas according to abilities, and to hold coordination meetings. The town did everything it should have, and we in the Self-Defense Forces hope that the next time we are called in to deal with a disaster that we are able to enjoy the kind of support and responsiveness provided by Mikuni.

6. Closing remarks